THE 73° GENERAL ASSEMBLY
AND
INTERNATIONAL SCIENTIFIC CONGRESS
OF THE WORLD FEDERATION OF HYDROTHERAPY
AND CLIMATOTHERAPY
(FEMTEC)

Science per Aquam: Balneotherapy research in Italy

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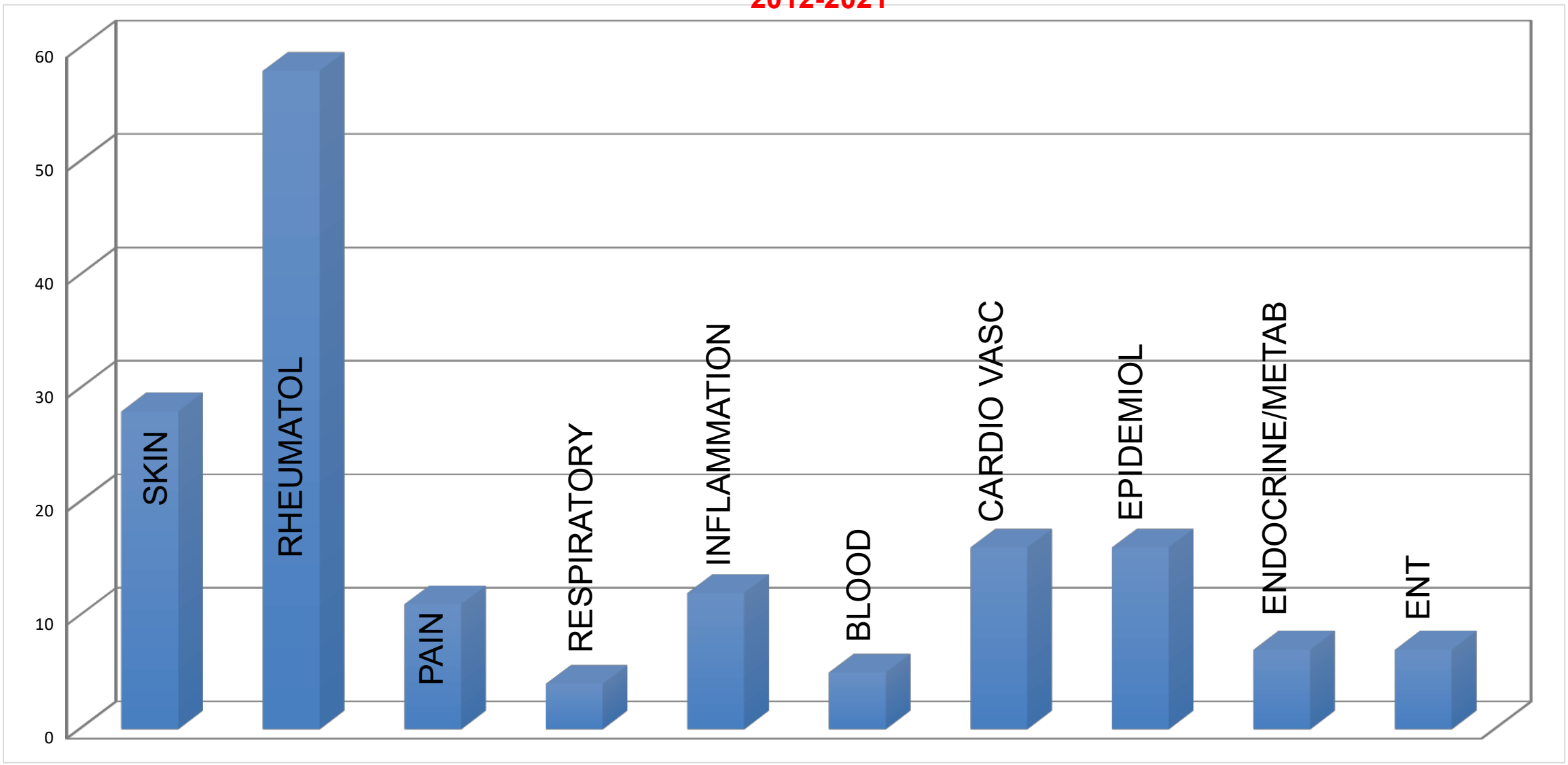
SPA

SALUS PER AQUAM

SCIENCE PER AQUAM

FoRST

CLINICAL SCIENCE PAPERS AVAILABLE IN PubMed
2012-2021



It’s conceivable that spa–based therapy was conserved through the centuries because of its intrinsic evidence-based value; nevertheless hystoric maintenance of ancient practices *per sé* is NOT a scientific proof of efficacy.

For this reason, thermalism must promote relevant scientific research

FoRST

afreth

Foundation for Scientific Research in Balneology

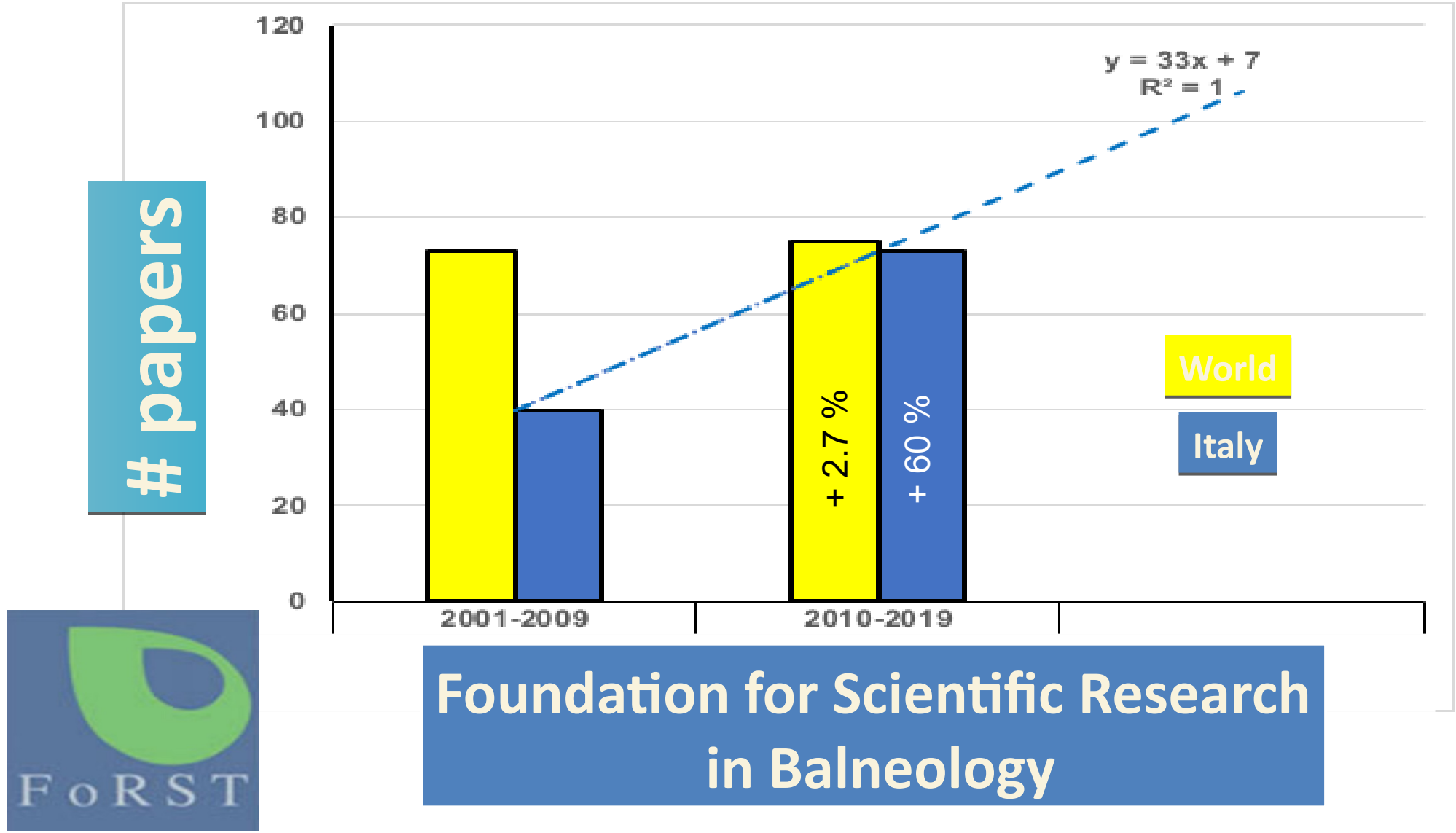
FoRST numbers

18 research calls

Over **8 M€** budgeted today

84 co-financed research projects

>80 scientific papers published



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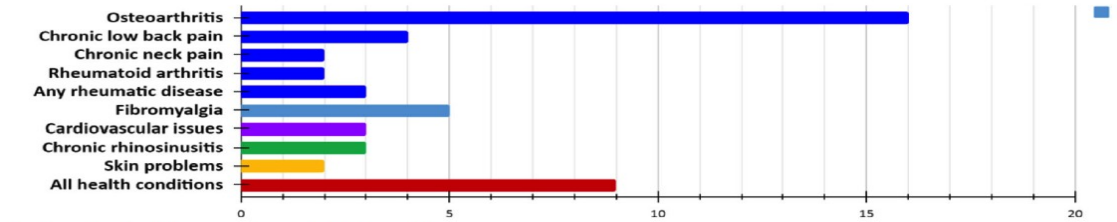
International Journal of Biometeorology
https://doi.org/10.1007/s00484-021-02133-w

REVIEW PAPER

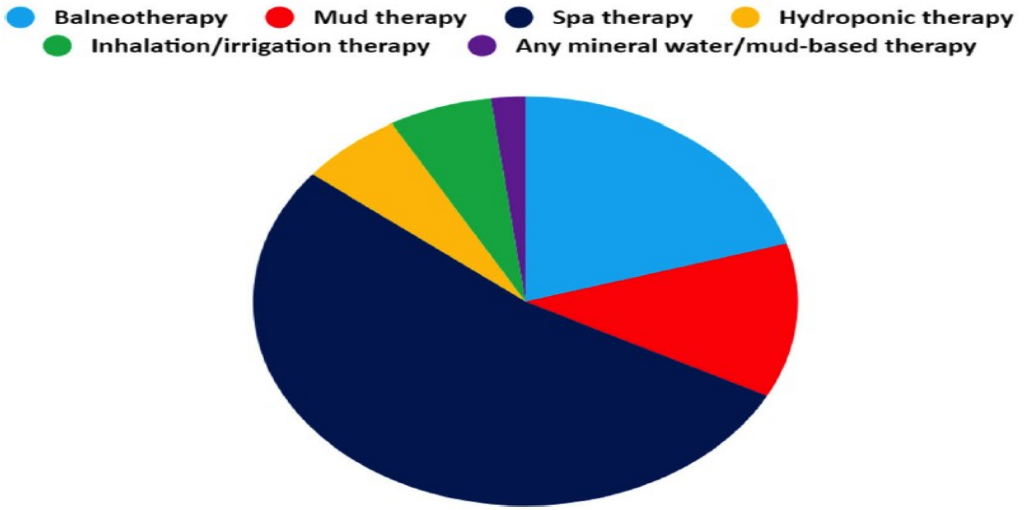
Clinical efficacy of medical hydrology: an umbrella review

Michele Antonelli [1] · Davide Donelli [1] · Licia Veronesi [2] · Marco Vitale [2,3] · Cesira Pasquarella [2]

Received: 28 December 2020 / Revised: 7 April 2021 / Accepted: 10 April 2021



Number of included reviews for each health condition



World Health Organization

HydroGlobe

HydroGlobe
Definition of a global framework for hydrotherapy

A FEMTEC – FoRST joint project
with the cooperation of ISMH and the support of WHO

FEMTEC

FoRST

Inflammation

Benedetti *et al. Journal of Translational Medicine* 2014, **12**:145
http://www.translational-medicine.com/content/12/1/145

JOURNAL OF TRANSLATIONAL MEDICINE

RESEARCH Open Access

Sulfur compounds block MCP-1 production by *Mycoplasma fermentans*-infected macrophages through NF-κB inhibition

Francesca Benedetti[1,2], Sergio Davinelli[1,3], Selvi Krishnan[1], Robert C Gallo[1], Giovanni Scapagnini[3], Davide Zella[1] and Sabrina Curreli[1*]

Benedetti *et al. J Transl Med (2017) 15:100*
DOI 10.1186/s12967-017-1206-8

Journal of
Translational Medicine

REVIEW Open Access

Anti-inflammatory effects of H_2S during acute bacterial infection: a review

Francesca Benedetti[1*], Sabrina Curreli[1], Selvi Krishnan[1], Sergio Davinelli[2], Fiorenza Cocchi[1], Giovanni Scapagnini[2], Robert C. Gallo[1] and Davide Zella[1]

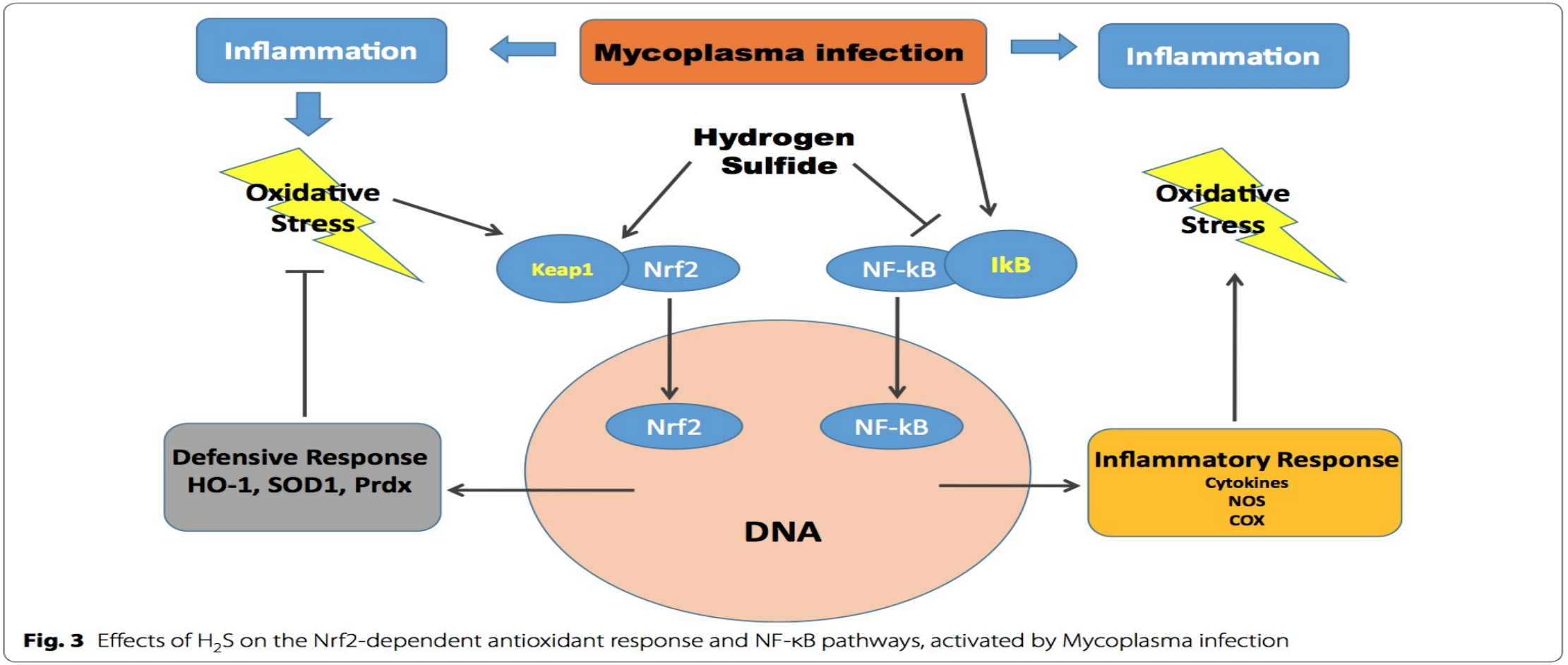
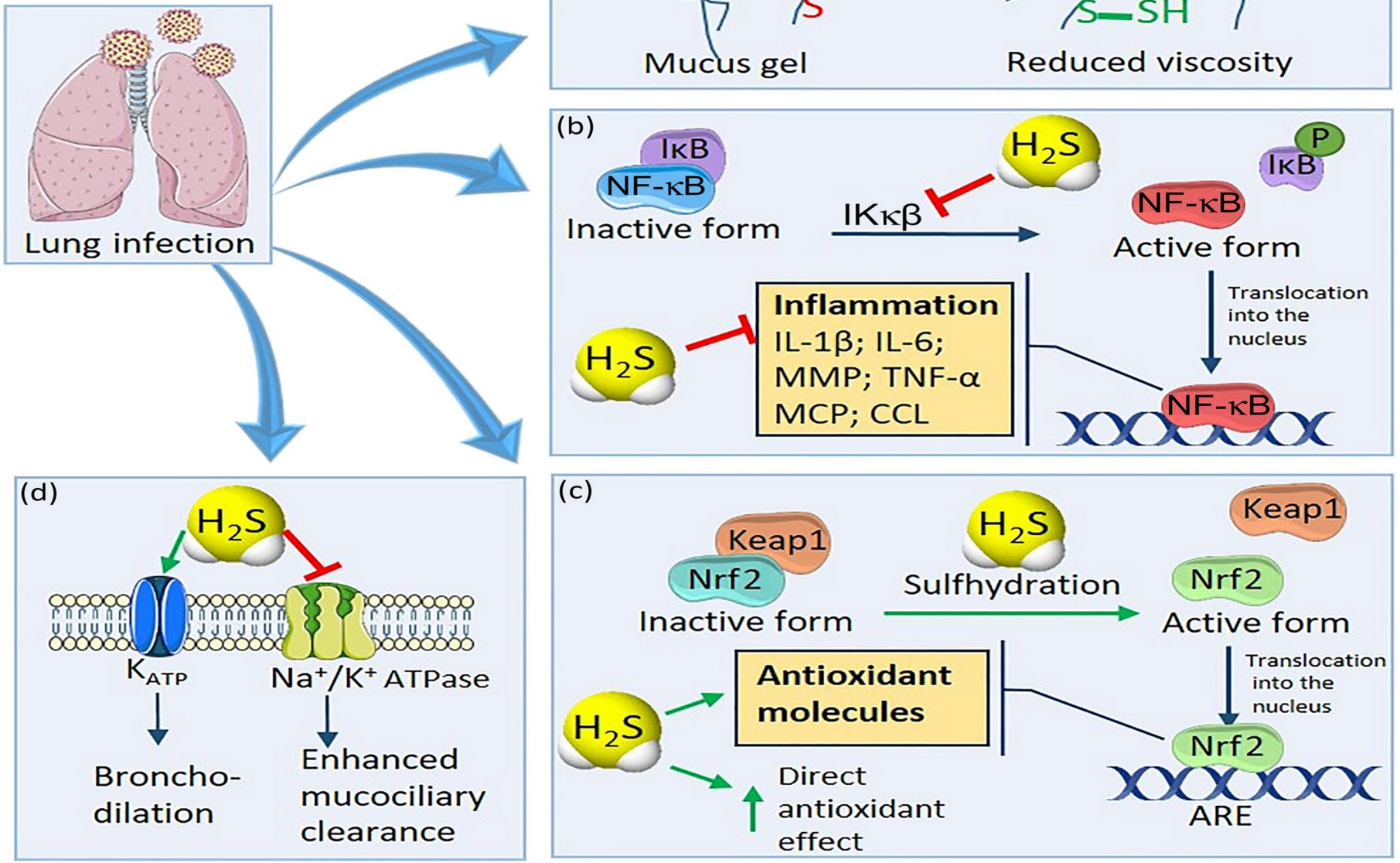


Fig. 3 Effects of H_2S on the Nrf2-dependent antioxidant response and NF-κB pathways, activated by Mycoplasma infection

Respiratory system



H_2S

Breaks mucin S-S

Blocks activation of NF-kB pathway

Activates Nrf2

Activates K_{ATP} channels

Respiratory Medicine (2005) 99, 748–754

respiratoryMEDICINE

Effect of inhalation of thermal water on airway inflammation in chronic obstructive pulmonary disease

Manuela Pellegrini[a], Davide Fanin[a], Yohann Nowicki[a], Gabriella Guarnieri[a], Anna Bordin[a], Diego Faggian[b], Mario Plebani[b], Marina Saetta[c], Piero Maestrelli[a,*]

[a]*Department of Environmental Medicine and Public Health, University of Padova, via Giustiniani, 2 35128 Padova (PD), Italy*
[b]*Department of Laboratory Medicine, University Hospital, Padova*
[c]*Department of Clinical and Experimental Medicine, University of Padova, Italy*

International Journal of COPD

Dovepress
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Open Access Full Text Article

ORIGINAL RESEARCH

Medicinal clays improve the endurance of loaded inspiratory muscles in COPD: a randomized clinical trial of nonpharmacological treatment

This article was published in the following Dove Press journal:
International Journal of COPD
23 October 2015
Number of times this article has been viewed

Simonetta Baldi,[1] Gian Domenico Pinna,[2] Claudio Bruschi,[1] Fabrizio Caldara,[3] Roberto Maestri,[2] Elena Dacosto,[1] Antonella Rezzani,[1] Ermanno Popovich,[1] Ezio Bellinzona,[1] Paola Crotti,[1] Silvia Montemartini,[1] Claudio Fracchia[1]

Background: Inspiratory resistive breathing (IRB) challenges affect respiratory muscle endurance in healthy individuals, which is considered to be an interleukin 6 (IL-6)–dependent mechanism. Whether nonpharmacological thermal therapies promote the endurance of loaded inspiratory muscles in chronic obstructive pulmonary disease (COPD) is unclear. The objectives of this study were to compare the effects of two thermal interventions on endurance time (ET) and plasma IL-6 concentration following an IRB challenge.

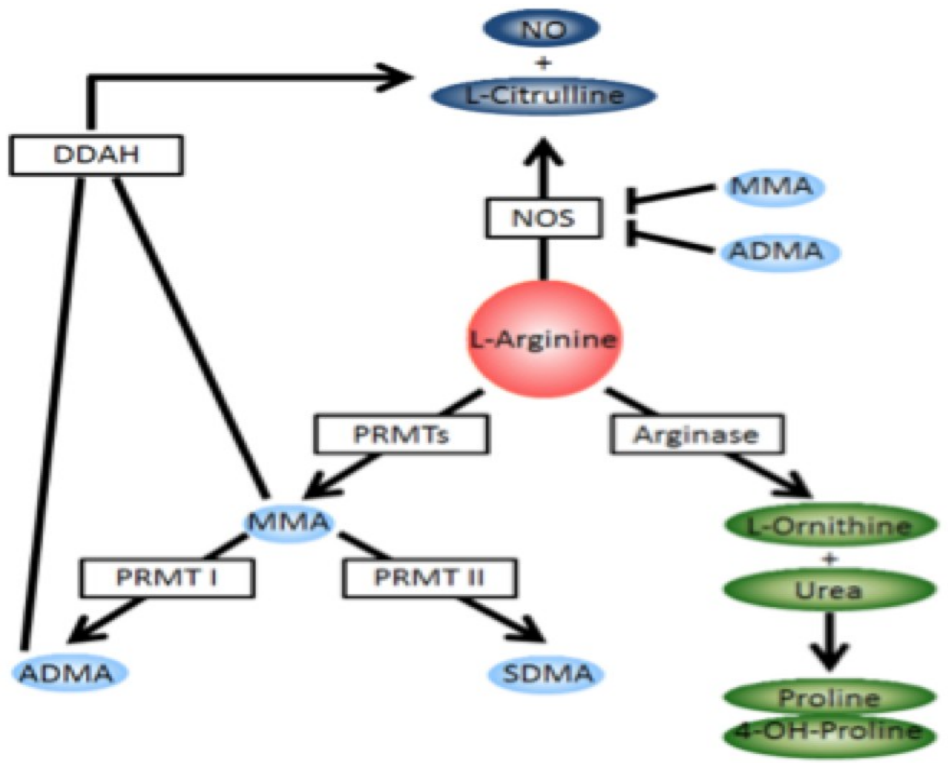
Methods: This study was a randomized, parallel-group, unblinded clinical trial in a single-center setting. Forty-two patients (aged 42–76 years) suffering from mild to severe COPD participated

International Journal of Biometeorology
September 2019, Volume 63, Issue 9, pp 1209–1216 | Cite as

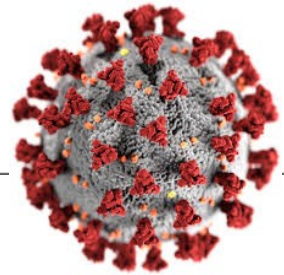
Sulphurous thermal water inhalation impacts respiratory metabolic parameters in heavy smokers

Authors Authors and affiliations

Cecilia Carubbi, Elena Masselli, Elisa Calabrò, Elisa Bonati, Carlotta Galeone, Roberta Andreoli, Matteo Goldoni, Massimo Corradi, Nicola Sverzellati, Giulia Pozzi, Antonio Banchini, Ugo Pastorino, Marco Vitale



biomedicines

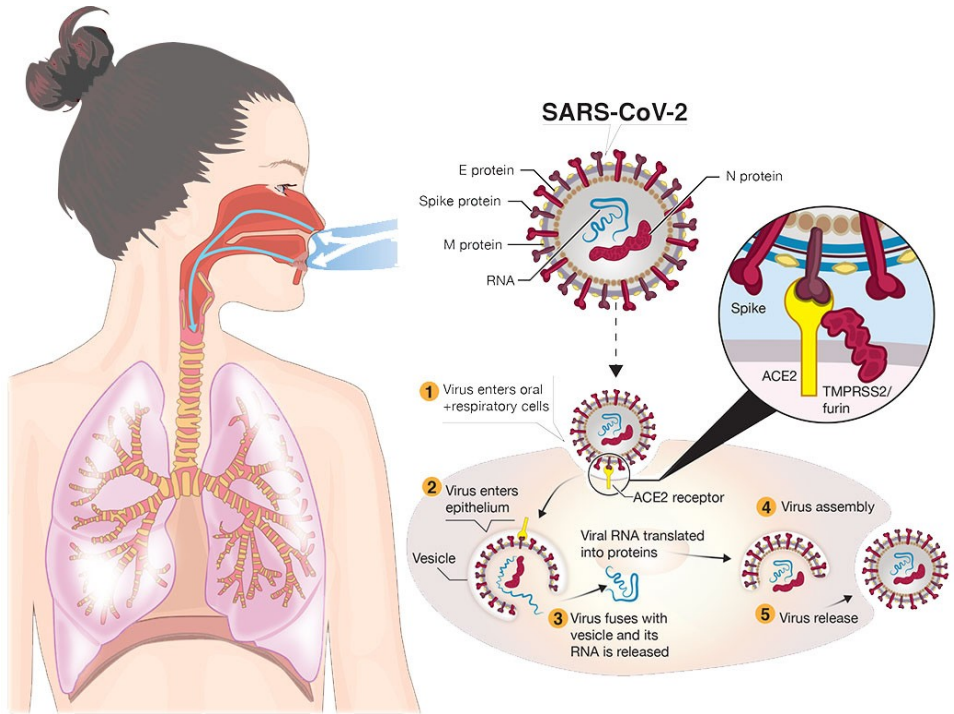


MDPI

Article

Hydrogen Sulfide Inhibits TMPRSS2 in Human Airway Epithelial Cells: Implications for SARS-CoV-2 Infection

Giulia Pozzi [1,†], Elena Masselli [1,†], Giuliana Gobbi [1], Prisco Mirandola [1], Luis Taborda-Barata [2], Luca Ampollini [1], Paolo Carbognani [1], Cristina Micheloni [1], Francesco Corazza [1], Daniela Galli [1], Cecilia Carubbi [1,*] and Marco Vitale [1,3]



Immunity

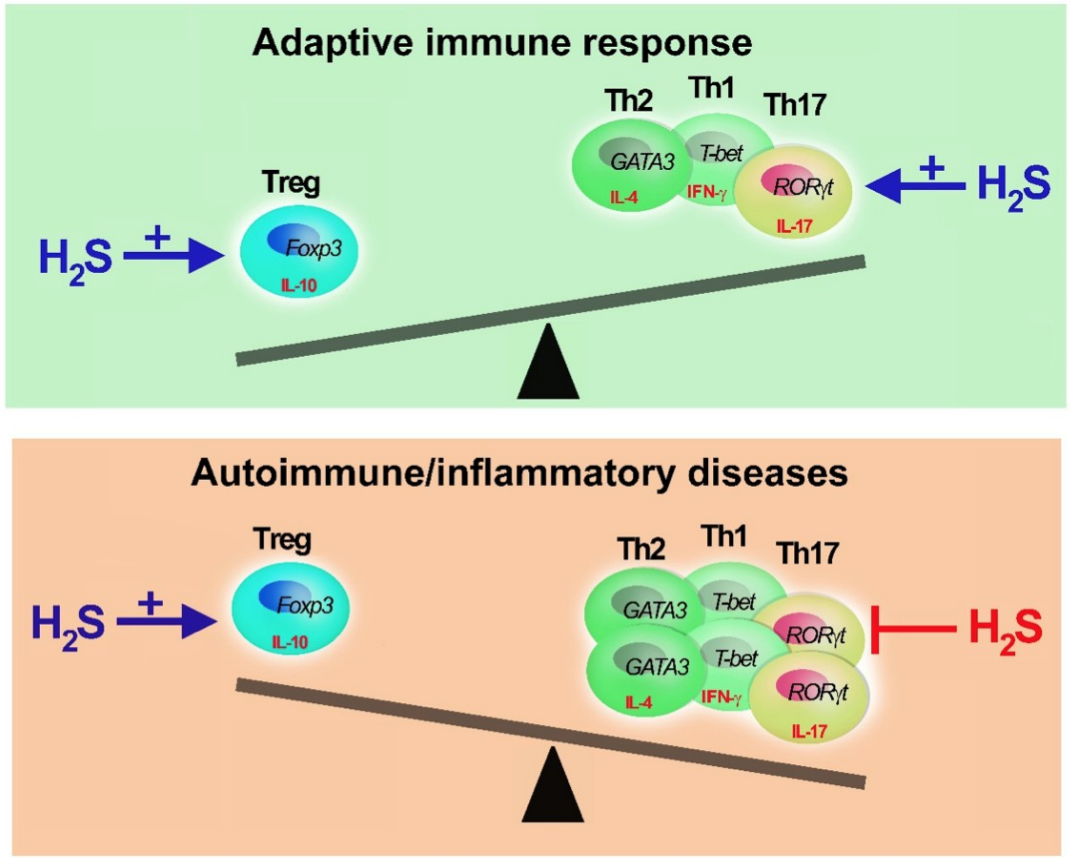
cells

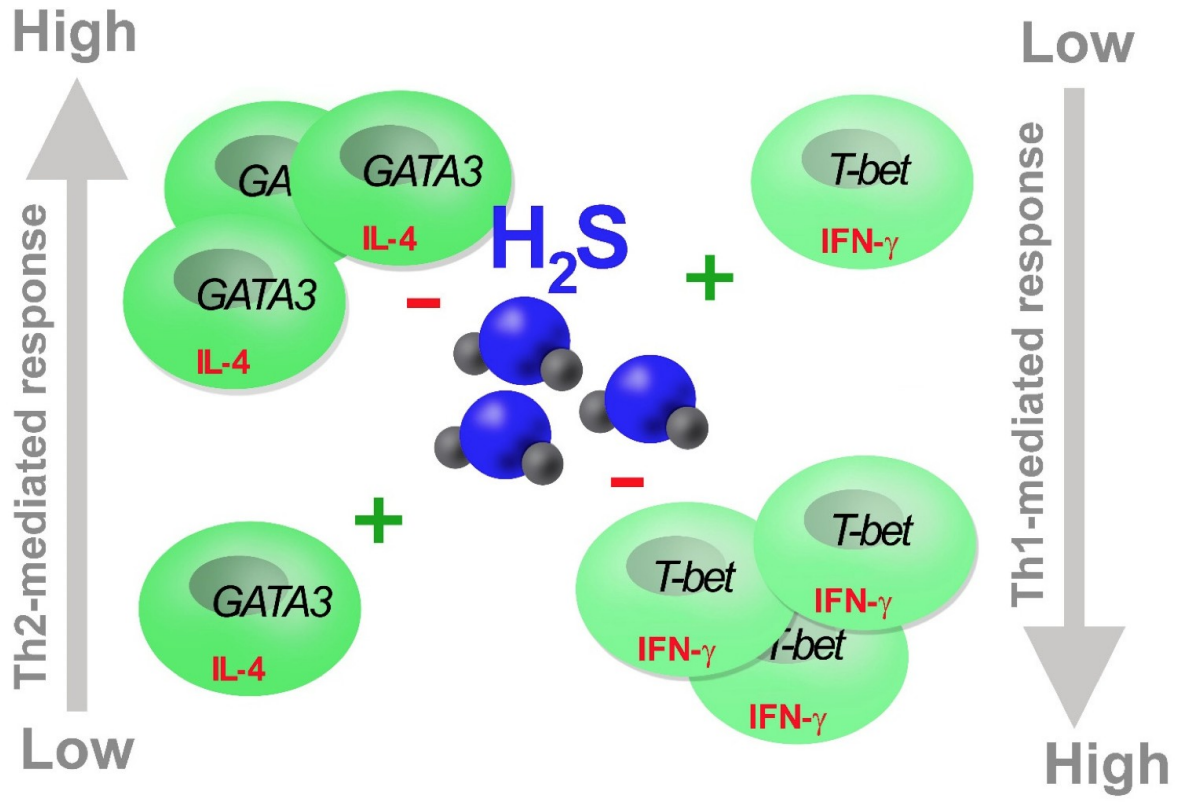
MDPI

Review

Buffering Adaptive Immunity by Hydrogen Sulfide

Giulia Pozzi [1], Giuliana Gobbi [1], Elena Masselli [1,2,*], Cecilia Carubbi [1], Valentina Presta [1], Luca Ambrosini [1], Marco Vitale [1,2,3] and Prisco Mirandola [1,*]





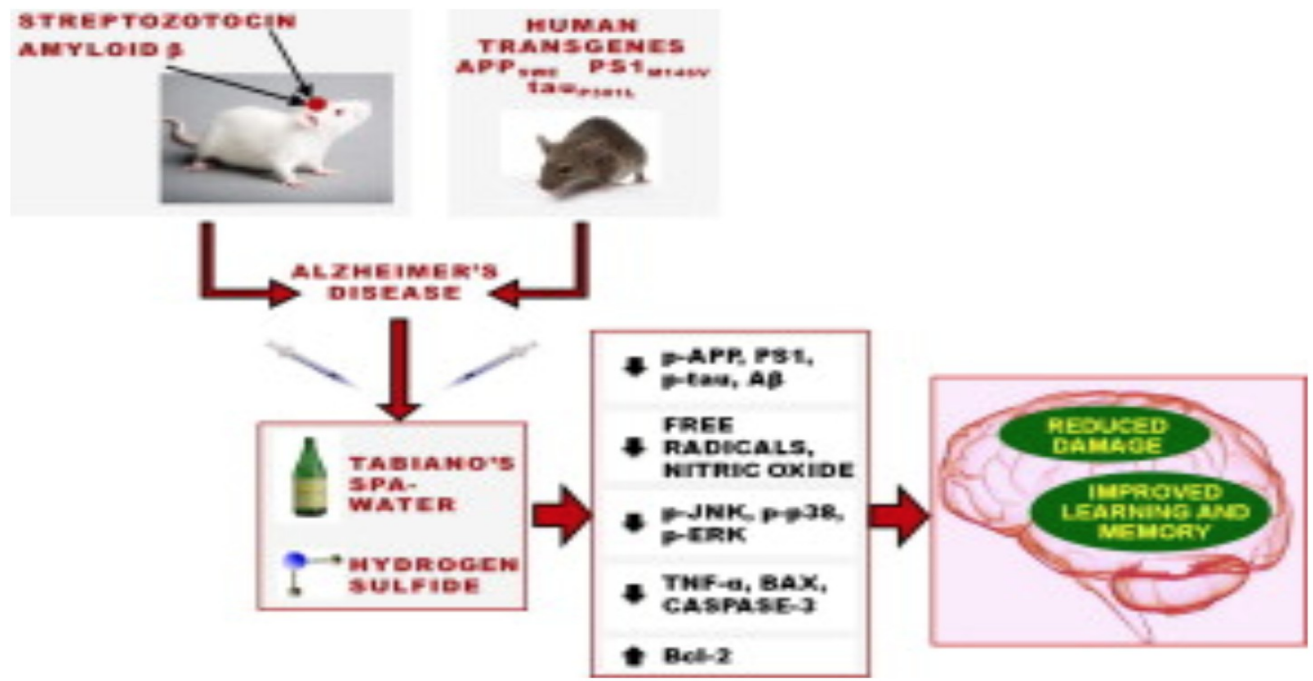
Neurodegenerative diseases

Neurobiology of Learning and Memory

Volume 104, September 2013, Pages 82–91

Hydrogen sulfide slows down progression of experimental Alzheimer's disease by targeting multiple pathophysiological mechanisms

Daniela Giuliani[a], Alessandra Ottani[a], Davide Zaffe[b], Maria Galantucci[a], Flavio Strinati[c], Renzo Lodi[d], Salvatore Guarini[a]



Pharmacology

Research Article

Pharmacology 2019;103:50–60
DOI: 10.1159/000494113

Received: July 27, 2018
Accepted after revision: September 26, 2018
Published online: November 16, 2018

Mechanisms of Hydrogen Sulfide against the Progression of Severe Alzheimer's Disease in Transgenic Mice at Different Ages

Eleonora Vandini[a] Alessandra Ottani[a] Davide Zaffe[b] Anita Calevro[a]
Fabrizio Canalini[a] Gian Maria Cavallini[c] Rosario Rossi[d] Salvatore Guarini[a]
Daniela Giuliani[a]

[a]Department of Biomedical, Metabolic and Neural Sciences, Section of Pharmacology and Molecular Medicine, University of Modena and Reggio Emilia, Modena, Italy; [b]Department of Biomedical, Metabolic and Neural Sciences, Section of Anatomy, University of Modena and Reggio Emilia, Modena, Italy; [c]Department of Ophthalmology, University of Modena and Reggio Emilia, Modena, Italy; [d]Department of Cardiology, University of Modena and Reggio Emilia, Modena, Italy

Musculo-skeletal rehab

Ann Ist Super Sanità 2017 | Vol. 53, No. 1: 70-76
DOI: 10.4415/ANN_17_01_13

Appropriateness and efficacy of Spa therapy for musculoskeletal disorders. A Delphi method consensus initiative among experts in Italy

Marco Paoloni[1], Andrea Bernetti[1], Ovidio Brignoli[2], Daniela Coclite[3], Antonio Fraioli[4], Stefano Masiero[5], Antonello Napoletano[3], Nicola Quirino[6], Franco Rengo[7], Carlo Ruosi[8], Ugo Viora[9], Marco Vitale[10] and Valter Santilli[1]

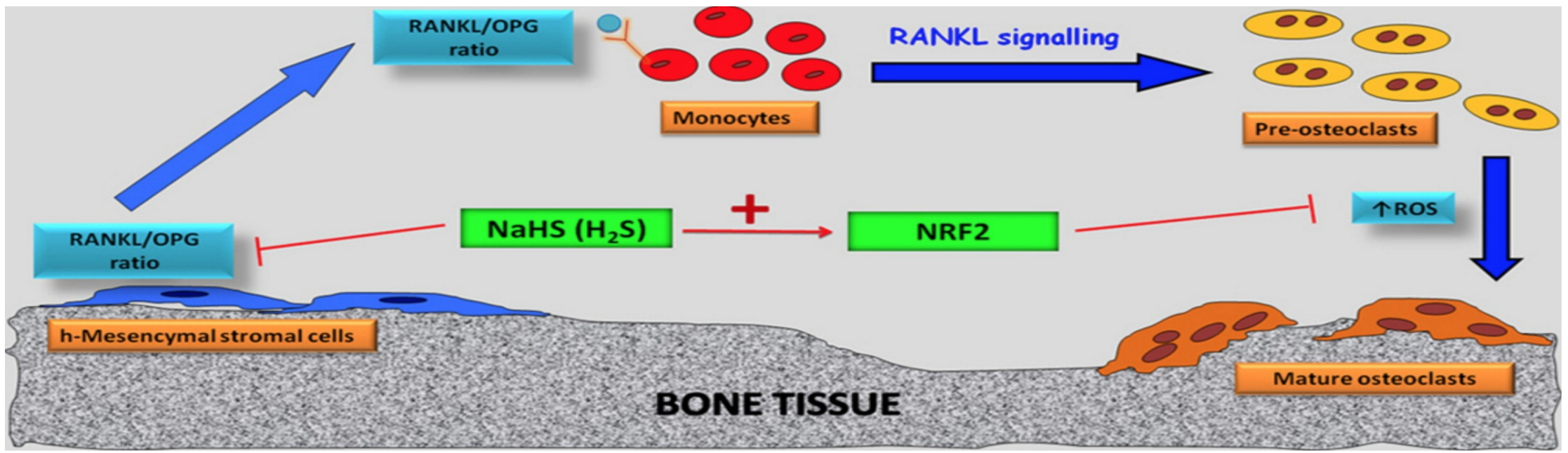
Results. Large consensus was obtained for statements grouped under the following main themes: treatment indications; choice of treatment modality and treatment efficacy.
Conclusions. The experts developed a number of consensus statements which may be used as a practical reference to guide the choice of physicians to treat musculoskeletal diseases with Spa therapy.

Pharmacological Research

Volume 87, September 2014, Pages 99-112

Sodium hydrosulfide inhibits the differentiation of osteoclast progenitor cells *via* NRF2-dependent mechanism ☆

Laura Gambari [a], Gina Lisignoli [a, b, 1], Luca Cattini [a, b], Cristina Manferdini [a, b], Andrea Facchini [a, b, c], Francesco Grassi [b] 1 ✉



Rheumatic diseases

Joint Bone Spine 84 (2017) 9–13

Available online at
ScienceDirect
www.sciencedirect.com

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EM|consulte
www.em-consulte.com/en

Editorial

Current role for spa therapy in rheumatology

ARTICLE INFO

Keywords:
Spa therapy
Creno-balneotherapy
Hydrotherapy
Osteoarthritis
Low back pain
Fibromyalgia
Ankylosing spondylitis
Rheumatoid arthritis

method. Other trials compared spa therapy to a validated treatment or to the standard of care. Spa therapy was then viewed as effective only if it proved superior over the comparator. Finally, some trials involved randomizing the patients before seeking their informed consent, as described by Zelen [3], to obtain at least partial patient blinding, thereby limiting deception bias. The optimal methodology remains to be devised. One option for further minimizing bias might consist in stratifying the randomization scheme based on patient preferences and expectations [4].

2. Results of the main clinical trials

Rheumatol Int (2007) 27:1157–1161
DOI 10.1007/s00296-007-0358-x

ORIGINAL ARTICLE

Effects of mud-bath treatment on fibromyalgia patients: a randomized clinical trial

Antonella Fioravanti · Giuseppe Perpignano · Giuseppe Tirri · Gabriella Cardinale · Chiara Gianniti · Cosima Elvira Lanza · Antonello Loi · Enrico Tirri · Paolo Sfriso · Franco Cozzi

EULAR revised recommendations for the management of fibromyalgia

Table 3 Recommendations
Management of fibromyalgia should aim at improving health-related quality of life balancing benefit and risk of treatment that often requires a multidisciplinary approach with a combination of non-pharmacological and pharmacological treatment modalities tailored according to pain intensity, function, associated features (such as depression), fatigue, sleep disturbance and patient preferences and comorbidities; by shared decision-making with the patient. Initial management should focus on non-pharmacological therapies.
Specific recommendations
Non-pharmacological management
Aerobic and strengthening exercise
Cognitive behavioural therapies
Multicomponent therapies
Defined physical therapies: acupuncture or hydrotherapy
Meditative movement therapies (qigong, yoga, tai chi) and mindfulness-based stress reduction
Pharmacological management
Amitriptyline (at low dose)
Duloxetine or milnacipran
Tramadol
Pregabalin
Cyclobenzaprine

Ann Rheum Dis 2017; 76: 318-328.

ACCORDO D' INTESA

PROGETTO/PROTOCOLLO: AFA FIBROMIALGIA IN AMBIENTE TERMALE

Oggetto: Linee di Indirizzo regionali per la diagnosi e trattamento della Fibromialgia

In allegato alla presente si trasmettono le "Linee di Indirizzo per la diagnosi e trattamento della Fibromialgia" (allegato 1). Il documento è il frutto di un percorso di condivisione tra professionisti di diverse discipline e utenti, basato sulle più aggiornate evidenze disponibili nella letteratura internazionale, sull'esperienza clinica quotidiana e sull'esperienza dei pazienti.

In particolare, al gruppo di lavoro, coordinato da questa direzione, hanno partecipato l'Associazione Malati Reumatici Emilia-Romagna (AMRER), i professionisti delle Aziende Sanitarie, i Medici di Medicina Generale, e l'Agenzia Sanitaria e Sociale Regionale.

Questo documento di consenso rappresenta una delle prime esperienze a livello nazionale di inquadramento della diagnosi e presa in carico delle persone affette da fibromialgia, ed è anche oggetto di confronto con il Ministero della Salute e con il Consiglio Superiore di Sanità.

Rheumatol Int (2013) 33:241–245
DOI 10.1007/s00296-011-2147-9

SHORT COMMUNICATION

The effects of combined spa therapy and rehabilitation on patients with ankylosing spondylitis being treated with TNF inhibitors

Luca Ciprian · Alessandro Lo Nigro · Michela Rizzo · Alessandra Gava · Roberta Ramonda · Leonardo Punzi · Franco Cozzi

Joint Bone Spine 82 (2015) 104–108

Available online at
ScienceDirect
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www.em-consulte.com/en

Original article

Effects of mud-bath therapy in psoriatic arthritis patients treated with TNF inhibitors. Clinical evaluation and assessment of synovial inflammation by contrast-enhanced ultrasound (CEUS)

Franco Cozzi[a,*], Bernd Raffeiner[a], Valeria Beltrame[b], Luca Ciprian[a], Alessandro Coran[b], Constantin Botsios[a], Egle Perissinotto[c], Enrico Grisan[d], Roberta Ramonda[a], Francesca Oliviero[a], Roberto Stramare[b], Leonardo Punzi[a]

[a] *Rheumatology Unit, Department of Medicine - DIMED, University of Padova, Padova, Italy*
[b] *Radiology Unit, Department of Medicine, University of Padova, Padova, Italy*
[c] *Unit of Statistics, Epidemiology and Public Health, Department of Cardiac, Thoracic and Vascular Sciences, University of Padova, Padova, Italy*
[d] *Department of Information Engineering, University of Padova, Padova, Italy*

Dermatology

Journal of
Clinical Medicine

MDPI

Review

The Role of Thermal Water in Chronic Skin Diseases Management: A Review of the Literature

Sara Cacciapuoti [1], Maria A. Luciano [2,*], Matteo Megna [1], Maria C. Annunziata [1], Maddalena Napolitano [3], Cataldo Patruno [4], Emanuele Scala [1], Roberta Colicchio [5], Chiara Pagliuca [5], Paola Salvatore [5,†] and Gabriella Fabbrocini [1,†]

npj | Biofilms and Microbiomes

www.nature.com/npjbiofilms

ARTICLE OPEN

Unexplored diversity and strain-level structure of the skin microbiome associated with psoriasis

Adrian Tett[1], Edoardo Pasolli[1], Stefania Farina[2], Duy Tin Truong[1], Francesco Asnicar[1], Moreno Zolfo[1], Francesco Beghini[1], Federica Armanini[1], Olivier Jousson[1], Veronica De Sanctis[3], Roberto Bertorelli[3], Giampiero Girolomoni[4], Mario Cristofolini[2] and Nicola Segata[1]

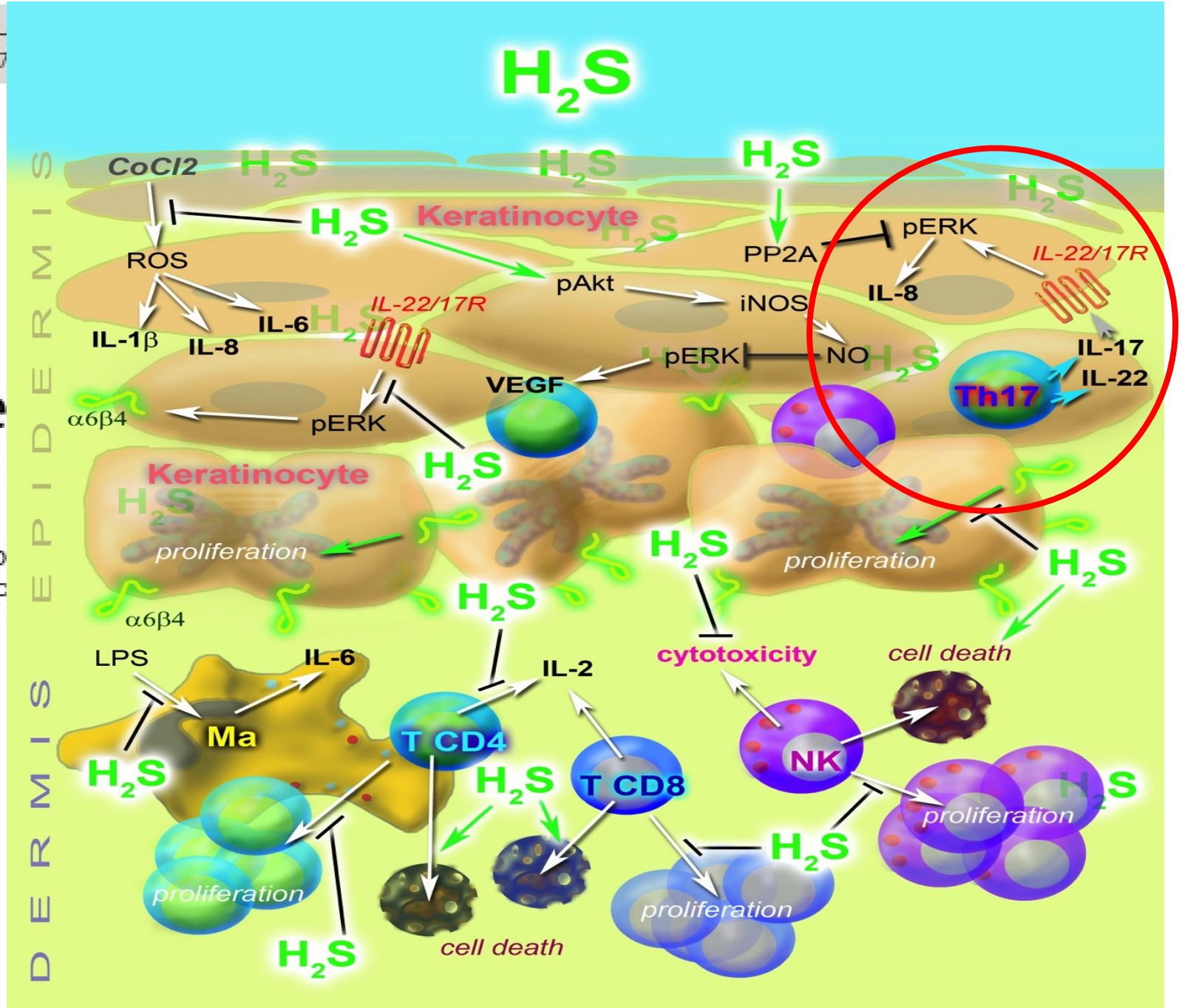
Psoriasis is an immune-mediated inflammatory skin disease that has been associated with cutaneous microbial dysbiosis by culture-dependent investigations and rRNA community profiling. We applied, for the first time, high-resolution shotgun metagenomics to characterise the microbiome of psoriatic and unaffected skin from 28 individuals. We demonstrate psoriatic ear sites have a decreased diversity and psoriasis is associated with an increase in *Staphylococcus*, but overall the microbiomes of psoriatic and unaffected sites display few discriminative features at the species level. Finer strain-level analysis reveals strain heterogeneity colonisation and functional variability providing the intriguing hypothesis of psoriatic niche-specific strain adaptation or selection. Furthermore, we accessed the poorly characterised, but abundant, clades with limited sequence information in public databases, including uncharacterised *Malassezia* spp. These results highlight the skins hidden diversity and suggests strain-level variations could be key determinants of the psoriatic microbiome. This illustrates the need for high-resolution analyses, particularly when identifying therapeutic targets. This work provides a baseline for microbiome studies in relation to the pathogenesis of psoriasis.

npj Biofilms and Microbiomes (2017)3:14 ; doi:10.1038/s41522-017-0022-5

Laboratory Investigation (2011) 91, 1188–

Hydrogen sulfide
keratinocytes *via*

Prisco Mirandola[1,2], Giuliana Gobb
Francesca Ruscitti[1], Giuseppe de P



Chronic Venous Disease

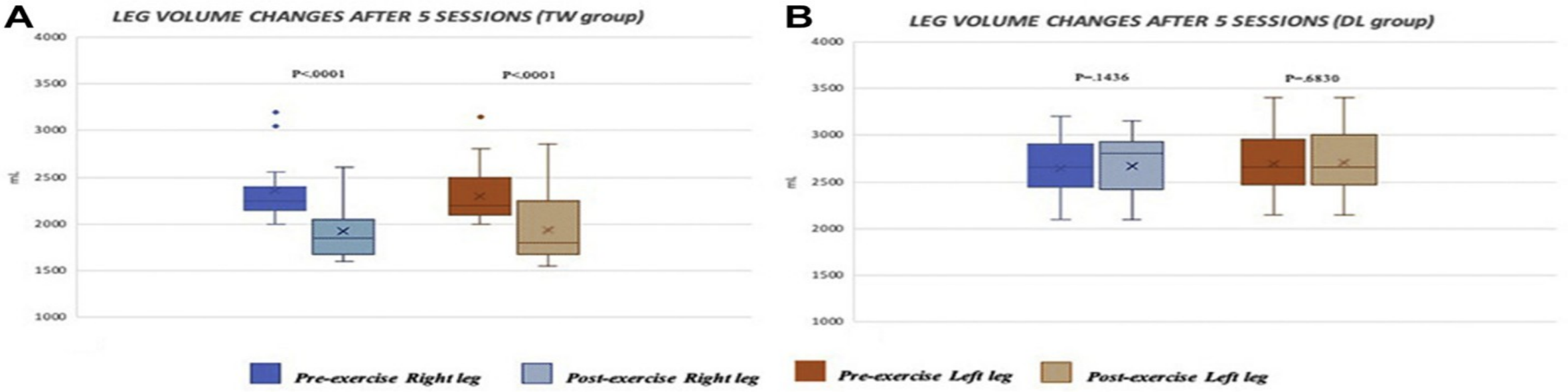
Chronic Venous Disease

Randomized controlled trial on Dryland And Thermal Aquatic standardized exercise protocol for chronic venous disease (DATA study)

Erica Menegatti, PhD,[a] Stefano Masiero, MD,[b] Paolo Zamboni, MD,[a] Giampiero Avruscio, MD,[c] Mirko Tessari, PhD,[a] Anselmo Pagani, BS,[a] *and* Sergio Gianesini, MD, PhD,[a,d] *Ferrara, Padua, and Padova, Italy; and Bethesda, Md*

Menegatti et al

Journal of Vascular Surgery: Venous and Lymphatic Disorders
September 2021



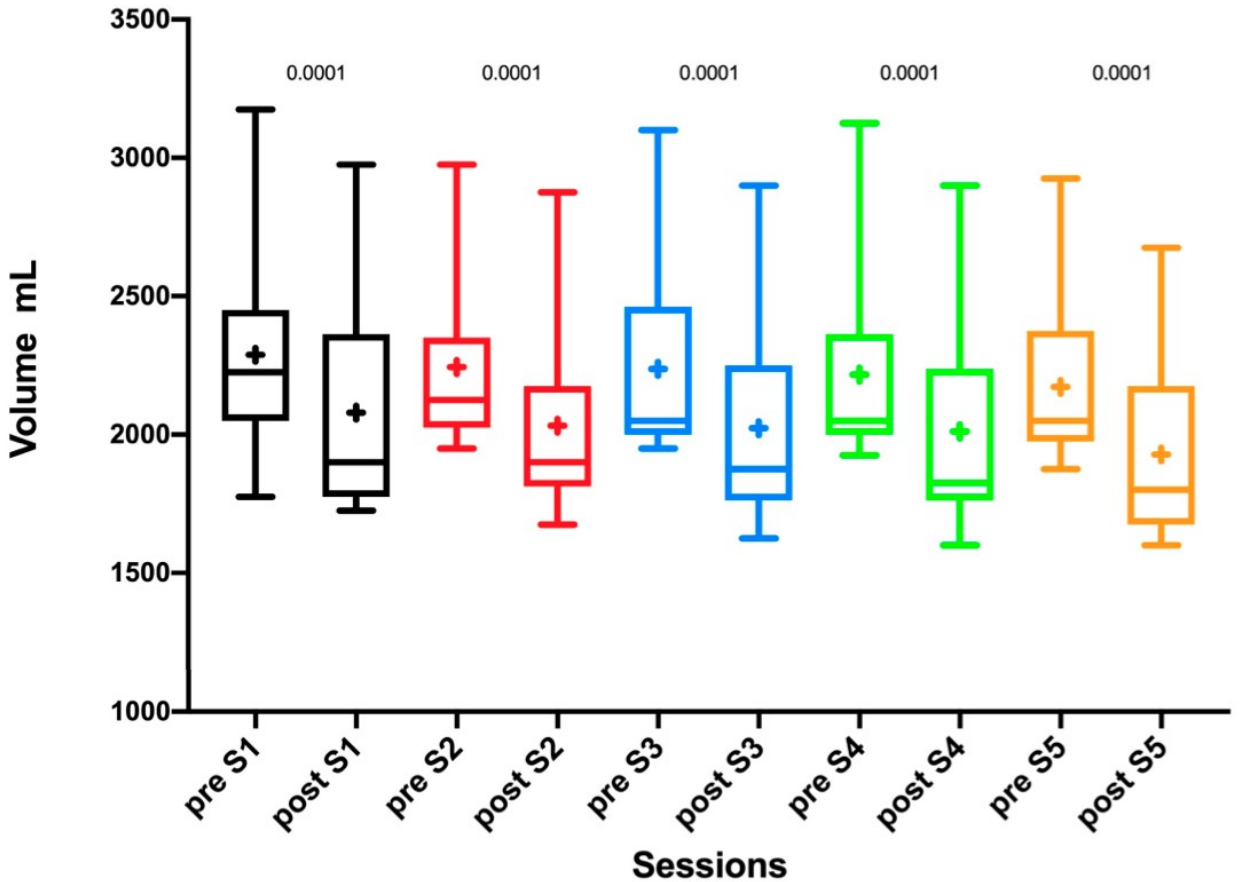
diagnostics

MDPI

Article

The Effects of Thermal Water Physical Exercise in Patients with Lower Limb Chronic Venous Insufficiency Monitored by Bioimpedance Analysis

Erica Menegatti [1,*], Anselmo Pagani [1], Giampiero Avruscio [2], Marianna Mucignat [1,3] and Sergio Gianesini [1,4]



Metabolic conditions

antioxidants

MDPI

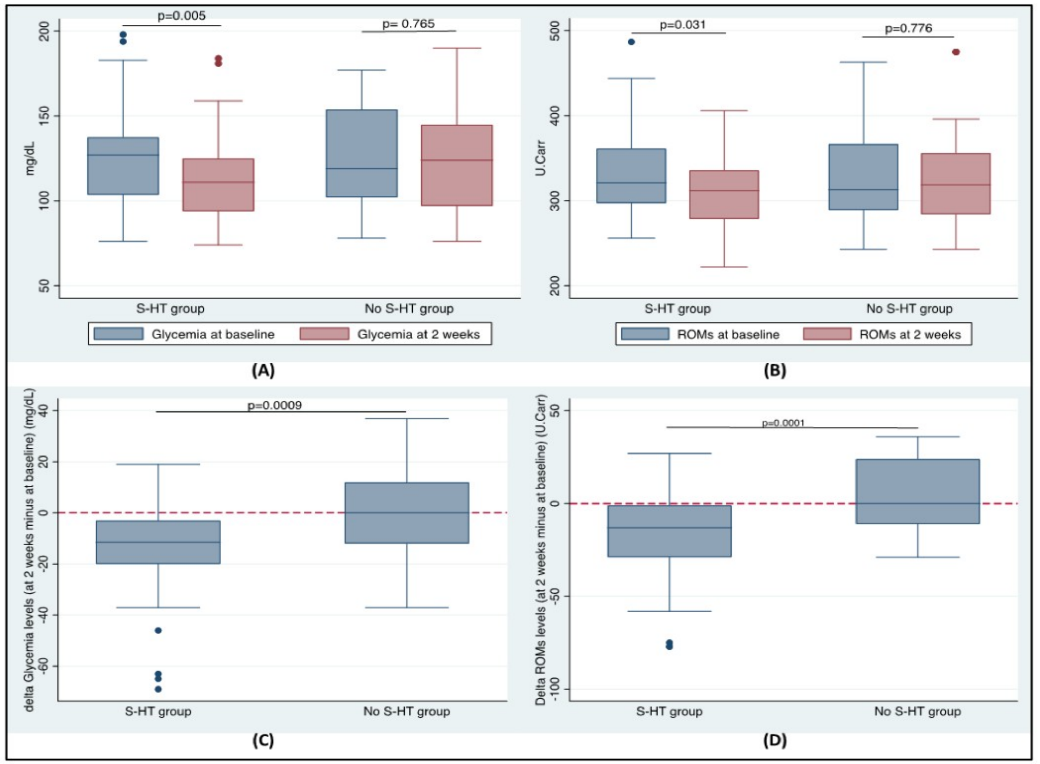
Article

Hydropinotherapy with Sulphurous Mineral Water as Complementary Treatment to Improve Glucose Metabolism, Oxidative Status, and Quality of Life

Maria Costantino [1,2,*,†], Valeria Conti [1,†], Graziamaria Corbi [3] and Amelia Filippelli [1,2]

Diabetes T2

Glycaemia and Reactive Oxigen Metab



SCIENCE PER AQUAM